

REMARKS

This Amendment is in response to the Office Action of March 7, 2006, in which claims 1 and 4-15 were rejected. With this Amendment, independent claims 1, 5, and 13 are amended. Claims 1 and 4-15, as amended, are presented for reconsideration and allowance.

The amendments to independent claims 1, 5, and 13 explicitly state that the slot in the rear portion of the crown is formed by forging. These amendments do not raise new issues, since forging to form the slot already existed in claims prior to this amendment. For example, dependent claim 9 states "wherein the slot is forged on a mold." Independent claim 13 already states "forging a sheet of titanium alloy against a mold to forge a crown with a slot . . ." It is requested, therefore, the amendments be entered and that the application be allowed.

In the Office Action, claims 1 and 4-9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sun (U.S. Patent No. 6,247,636) in view of Duclos (U.S. Patent No. 4,444,392). With this Amendment, independent claims 1 and 5 have been amended to explicitly state that the crown of the golf club head includes a slot formed by forging (i.e. "slotting"). The specification describes the formation of slot 28 by a process referred to as "slotting".

To form slot 28, a mold is formed of the negative of crown 18 with slot 28. Preferably, β -14 titanium alloy is cut to the correct size and shape to form crown 18 with slot 28. A compression machine presses the titanium material against the mold at a pressure of about 300,000 kg/m² to forge crown 18 with slot 28. The process is referred to as "slotting."

(Specification page 7, lines 21-25).

The golf club head of the present invention--with the crown including a slot which has been formed by forging and which has the dimensions specified in the claims--provides a number of significant benefits that are described in the specification.

Slotting along rear portion 20 of crown 18 substantially improves structural integrity. The stabilizing effect of slotting improves club performance in three ways. First, it provides back-weighting toward rear portion 20 and sole 30. The extra weight adjusts the center of gravity to produce the most desirable ball flight.

Second, as described above, slotting stiffens crown 18 of club head 14. This results in a substantial reduction in club head deformation (the momentary increase in driver height resulting from the impact of the ball upon face 16). Slotting dampens the energy-robbing effect of deformation and results in longer, straighter drives.

Third, in initial tests of golf club 10, players report a pleasant, solid sensation at impact.

A fourth benefit of slotting is the improved aerodynamics. Slot 28 produces a tunneling effect that redirects air flow during the golf swing resulting in smoother air contact against club head 14. Swing speed, depending on the individual, is enhanced from one to three miles per hour (mph). Extra swing speed, all factors remaining equal, translates into an extra 2.25 yards per mph.

Lastly, slotting is aesthetically pleasing, because the curved surface can be finished to match sole 30 which highlights slot 28.

(Specification page 8, line 15-page 9, line 5).

The Sun patent does not include a slot as defined in claims 1 and 5. Sun shows indentations on the top surface of the crown, but there is no slot extending along the rear portion of the crown as defined in claims 1 and 5.

The Duclos patent shows an open slot (i.e. a cutout) on the back surface of hollow clubs shown in Figs. 3, 4, and 5. It does not show a crown with a slot formed by forging. The slot shown in Figs. 3 and 4 does not improve structural stability of the club head. It does not stabilize the club head by

providing back weighting, by reducing club head deformation or by providing a solid sensation of impact. The purpose of the slot in Duclos is for aerodynamics--to remove drag.

In the case of FIGS. 3 and 4 of Duclos, head 40 is formed by casting, not by forging. The slot is an opening, not an indentation that is formed by "slotting" using a forging process.

In FIG. 6 and column 3, lines 31-51, Duclos describes an alternative construction in which the club head is a molded one-piece unit.

The manufacture of head 70 is more economic than the manufacture of the head 40 because it can be molded in one piece not requiring the additional operations of molding the cap member 58 and then welding it on the body piece 56.

(Duclos, col. 3, lines 47-51). (Emphasis added).

The slot 72 shown in FIG. 6 of Duclos is not formed by forging. Instead, the entire head 70 (including the slot 72) is molded as one piece. Slot 72 provides none of the structural stability advantages which are achieved by "slotting" using a forging process as described and claimed in the present application. Forging deforms and strengthens the metal as the slot of the invention is formed. That is not the case with slot 72 formed by casting.

Independent claims 1 and 5 and dependent claims 4 and 6-9 are neither taught nor suggested by Sun and Duclos. The rejection under 35 U.S.C. § 103 should be withdrawn, and claims 1 and 4-9 should be allowed.

Claims 10-12 were rejected under 35 U.S.C. § 103 over Sun in view of Duclos and further in view of Teramoto (U.S. Patent No. 6,315,678). Claims 10-12 depend from independent claim 5, and are neither taught nor suggested by Sun or Duclos. Teramoto does not provide the disclosure missing from Sun and Duclos. In fact, Teramoto does not describe any slotting, and certainly not a slot which is formed along the rear portion of the crown by forging. The rejection of claims 10-12 based upon Sun, Duclos, and Teramoto should be withdrawn and those claims allowed.

Claim 13 was rejected under 35 U.S.C. § 103 as being unpatentable over Sun in view of Duclos and further in view of Hancock et al. (U.S. Patent No. 6,089,070). As noted in the Office Action, Sun discloses a club head that has no slot. As previously discussed, Duclos describes a club head that is cast (in the case of FIGS. 3 and 4) or molded (in case of FIG. 6). The slots in Duclos do not provide structural stability to the club head.

While Hancock may disclose forging processes, it does not disclose the benefits of "slotting"--forming a slot in the rear portion of the crown by forging to achieve structural stability benefits as taught in the present invention. There is nothing in Sun or Duclos which would suggest that any benefit could be obtained by using forging techniques to form a slot, and neither reference suggests any benefit can be obtained in terms of structural stability by creating a slot in the rear portion of the crown (or anywhere else for that matter). The rejection of claim 13 based upon Sun, Duclos, and Hancock should be withdrawn.

Paragraphs 14 and 15, which depend from independent claim 13, were rejected under 35 U.S.C. § 103 over Sun, Duclos, Hancock, and Teramoto. As previously discussed, Teramoto does not provide the disclosure missing from Sun or Duclos, and the combination of Sun, Duclos, Hancock and Teramoto still does not teach the subject matter of independent claim 13, let alone dependent claims 14 and 15. The rejection of those claims should be withdrawn.

In conclusion, claims 1 and 4-15 are now in condition for allowance.

Respectfully submitted,

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Date: 5/18/06

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